

## CLAIMS

What is claimed is:

- 1 1. A method comprising:
  - 2 creating a correlation for an address set between a current address in the
  - 3 address set and a previous address in the address set; and
  - 4 storing the correlation for the address set.
- 1 2. The method of claim 1 further comprising:
  - 2 retrieving the correlation for the address set when the previous address is
  - 3 observed in an address stream.
- 1 3. The method of claim 1 further comprising:
  - 2 grouping addresses into a plurality of address sets.
- 1 4. The method of claim 1, wherein creating a correlation for an address set
  - 2 comprises:
    - 3 recording the previous address in a set address history data structure;
    - 4 retrieving the previous address from the set address history data structure
    - 5 when the current address is observed in an address stream; and
    - 6 replacing the previous address in the set address history data structure with the
    - 7 current address.
- 1 5. The method of claim 1, wherein the current and previous addresses are cache
  - 2 memory misses.

1 6. The method of claim 1, wherein the current and previous addresses are  
2 instruction addresses.

1 7. The method of claim 1, wherein storing the correlation comprises:  
2 determining a slot in a set correlation data structure in which to store the  
3 correlation; and  
4 keying the correlation in the set correlation data on the previous address.

1 8. A machine-readable medium providing instructions, which when executed by  
2 a processing unit, causes the processing unit to perform operations comprising:  
3 creating a correlation for an address set between a current address in the  
4 address set and a previous address in the address set; and  
5 storing the correlation for the address set.

1 9. The machine-readable medium of claim 8 providing further instructions  
2 comprising:  
3 retrieving the correlation for the address set when the previous address is  
4 observed in an address stream.

1 10. The machine-readable medium of claim 8 providing further instructions  
2 comprising:  
3 grouping addresses into a plurality of address sets.

1 11. The machine-readable medium of claim 8 providing further instructions  
2 comprising:

3 recording the previous address in a set address history data structure;  
4 extracting the previous address from the set address history data structure  
5 when the current address is observed in an address stream; and  
6 replacing the previous address in the set address history data structure with the  
7 current address.

1 12. The machine-readable medium of claim 11, wherein the set address history  
2 data structure comprises:

3 an address set field containing data representing the address set; and  
4 a previous address field containing data representing the previous address for  
5 the address set identified by the address set field.

1 13. The machine-readable medium of claim 8 providing further instructions  
2 comprises:

3 determining a slot in a set correlation data structure in which to store the  
4 correlation; and  
5 keying the correlation in the set correlation data on the previous address.

1 14. The machine-readable medium of claim 13, wherein the set correlation data  
2 structure comprises:

3 a key address field containing data representing the previous address; and  
4 a successor address field containing data representing the current address  
5 correlated with the previous address identified by the key address field.

1 15. An apparatus comprising:

2 a processing unit;  
3 a memory coupled to the processing unit through a bus;  
4 set address correlation logic to create a correlation for an address set between  
5 a current address in the address set and a previous address in the address set; and  
6 a set correlation data structure to store the correlation created by the set  
7 address correlation logic.

1 16. The apparatus of claim 15 further comprising:  
2 a set address history data structure to record the previous address used to  
3 create the correlation.

1 17. The apparatus of claim 15 wherein the set address correlation logic further  
2 comprises logic to partition the memory into a plurality of address sets.

1 18. The apparatus of claim 15, wherein the set address correlation logic further  
2 comprises logic to retrieve the correlation from the set correlation data structure when  
3 the previous address is observed in an address stream.

1 19. The apparatus of claim 15, wherein the processing unit comprises cache logic  
2 to use the set address logic to predict future cache misses.

1 20. The apparatus of claim 15, wherein the processing unit comprises instruction  
2 scheduling logic to use the set address logic to predict future instructions.